

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Whitehorse Pond Summer Chinook Program
Species or Hatchery Stock:	Summer Chinook (<i>Onchorynchus tshawytscha</i>) Stillaguamish River
Agency/Operator:	Washington Department of Fish and Wildlife
Watershed and Region:	Stillaguamish River Puget Sound
Date Submitted:	, 2002
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SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Whitehorse Pond Summer Chinook Program

1.2) Species and population (or stock) under propagation, and ESA status.

Stillaguamish River Summer Chinook (*Onchorynchus tshawytscha*)

1.3) Responsible organization and individuals

Name (and title):	Chuck Johnson, Operations Manager
	Chuck Lavier, Skagit Complex Manager
Agency or Tribe:	Washington Department of Fish and Wildlife
Address:	600 Capitol Way North, Olympia, WA. 98501-1091
Telephone:	(360) 902-2653 (360) 864-6135
Fax:	(360) 902-2943 (360) 864-6122
Email:	johnscwj@dfw.wa.gov laviecml@dfw.wa.gov

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

Stillaguamish Tribe (Harvey Cr. Hatchery): collect broodstock, incubate and provide early rearing of fish before transfer to WDFW 's Whitehorse Hatchery.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

The Whitehorse Hatchery rearing program is funded by State Wildlife funds.

1.5) Location(s) of hatchery and associated facilities.

Whitehorse Pond is located 1.5 miles upstream of the mouth of Whitehorse Springs Creek (WRIA 05.0254A), a tributary to the N. F. Stillaguamish River (05.0135) at RM 28 from its confluence with the mainstem Stillaguamish River (05.0001).

Harvey Creek Hatchery is located 2 miles upstream of the mouth of Harvey/Armstrong Creek (05.0126), a tributary to the Stillaguamish River (05.0001) at RM 15.3.

1.6) Type of program.

Integrated Recovery

1.7) Purpose (Goal) of program.

Restoration

The goal of this program is to insure the short-term preservation and long term restoration of native Stillaguamish River summer chinook to self-sustaining levels.

1.8) Justification for the program.

The hatchery program will enhance or benefit the survival of the listed natural population (integrated recovery program) by:

1. Egg to emigrant survivals rates will be increased over rates attainable in the natural environment which will increase the abundance of adult fish returning to the river.
2. Natural spawning hatchery fish will hopefully lead to increases in abundance of self-sustaining, natural-origin recruit based summer chinook salmon.
3. All summer chinook salmon juveniles produced at the hatchery will be coded-wire tagged only (starting with 2000 brood year) prior to release. This application will likely affect the ability to monitor fisheries contribution, but it will protect fish from selective fisheries and enhance the recovery efforts.

1.9) List of program "Performance Standards".

1.10) List of program "Performance Indicators", designated by "benefits" and "risks."

Performance Standards and Indicators for Puget Sound **Integrated Recovery** Chinook programs.

Performance Standard	Performance Indicator	Monitoring and Evaluation Plan
Produce adult fish for spawning escapement	Survival and return rates	Monitor catch and survivals using CWTs, escapement data

Meet hatchery production goals	Number of juvenile fish released - 210,000	Estimating number of fish planted (weighing / counting fish), monitoring proximity to hatchery production goals, number released recorded on Hatchery Division's "plants reports", data available on WDFW database.
Manage for maximum escapement	Hatchery and wild return rates	Monitoring hatchery / wild return rates through trapping (at the hatchery or at weir), redd and snorkel surveys on the spawning grounds, catch records
Minimize interactions with listed fish through proper broodstock management	Total number of broodstock collected	<p>Measure number of fish actually spawned to meet eggtake goal</p> <p>Hatchery records</p> <p>Trap fish throughout run, dates and times recorded on Hatchery Division's "adult reports, date available on WDFW database.</p> <p>Spawner survey data, CWT data</p>
	Sex ratios	
	Timing of adult collection / spawning	
	Number of listed fish passed upstream	
	Hatchery stray rate	
	Number wild fish used in broodstock	
	Return timing of hatchery / wild adults	
	Adherence to spawning guidelines	
Minimize interactions with listed fish through proper rearing and release strategies	Juveniles released as smolts	Future Brood Document
	Out-migration timing of listed fish / hatchery fish	Hatchery records
	Size and time of release 70-90 fpp/mid-May	CWT data

Maintain stock integrity and genetic diversity	Effective population size	Spawning guidelines
	Monitor divergence of hatchery fish morphology and behavior characteristics	Spawner surveys
	HOR spawners	
<p>Maximize in-hatchery survival of broodstock and their progeny; and</p> <p>Limit the impact of pathogens associated with hatchery stocks, on listed fish</p>	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Follow Co-Manager's Disease Policy
	Fish pathologists will diagnose fish health problems and minimize their impact	
	Vaccines will be administered when appropriate to protect fish health	Fish Health exam reports
	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	
	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	
Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES reports

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

Target broodstock collection level is 130-150 fish (50:50 ratio male to female).

See Stillaguamish Tribal Summer Chinook HGMP.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location. *(Use standardized life stage definitions by species presented in Attachment 2).*

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry		
Fingerling	Whitehorse Pond (05.0254A)	210,000
Yearling		

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

Estimated 1986-93 (average) smolt-to-adult survival rate was .81%. Assuming this average, the proposed release of 210,000 sub-yearlings each year may lead to the production of approximately 1,782 summer chinook adults (Kip Killebrew, (Stillaguamish Tribal Biologist), HGMP Review, September 15, 2000).

1.13) Date program started (years in operation), or is expected to start.

1980

1.14) Expected duration of program.

Ongoing (when the population stabilizes at a level above the critical population threshold and the habitat limiting natural fish productivity is recovered, the hatchery program could be terminated).

1.15) Watersheds targeted by program.

Stillaguamish River (05.0001).

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

The use of a fish wheel trap to reduce mortality during broodstock collection is being proposed for evaluation.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

For Sections 2 & 3 please refer to the Stillaguamish Tribal Summer Chinook HGMP for details.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

- Identify the ESA-listed population(s) that will be directly affected by the program.**
- Identify the ESA-listed population(s) that may be incidentally affected by the program.**

WDFW shall monitor straying of the summer chinook program fish into the South Fork Stillaguamish River and take appropriate actions to prevent reduced genetic diversity in the South Fork chinook stock.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- Describe the status of the listed natural population(s) relative to “critical” and “viable” population thresholds (*see definitions in “Attachment 1”*).**

Critical and viable population thresholds under ESA have not been determined, however, the SASSI report (WDFW) determined this population (Stillaguamish Summer Chinook), to be "depressed".

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.**
- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.**
- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.**

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area,

and provide estimated annual levels of take (see “Attachment 1” for definition of “take”).

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Juvenile releases -

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

Complete the appended “take table” (Table 1) for this purpose. Provide a range of potential take numbers to account for alternate or “worst case” scenarios.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. Hood Canal Summer Chum Conservation Initiative) or other regionally accepted policies (e.g. the NPPC Annual Production Review Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

Puget Sound Management Plan

WDFW and the tribes shall develop a chinook escapement management plan for the Stillaguamish River.

3.3) Relationship to harvest objectives.

3.3.1) Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

3.4) Relationship to habitat protection and recovery strategies.

3.5) Ecological interactions.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

Whitehorse Hatchery is supplied by spring water from Whitehorse Spring. It has a seasonal flow range of 90 gallons per minute (gpm) in low flow years to peak flows of 2,800 gpm in the spring. Minimum flows during the time chinook are reared at the hatchery are above 800 gpm. Dissolved oxygen (DO) levels in this water supply range from 9 parts per million (ppm) to 10.5 ppm and temperature range from a low of 41 degrees Fahrenheit to highs of 55 degrees Fahrenheit.

The Whitehorse facility meets current NPDES permit standards and is compliant with NMFS screening criteria.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

The hatchery intakes at the facility conform with NMFS screening guidelines to minimize the risk of entrainment of juvenile listed fish.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

No broodstock are collected at the Whitehorse Hatchery. They are collected in-river with a small mesh (4 inch) gill net that entangle rather than gill the fish. Fish removed from the net are transferred to 4' X 4' X 8' soft mesh holding pens positioned near the point of capture for holding. The fish are hand-carried to a truck via wet burlap bags for transport to the Harvey Creek Hatchery for holding through spawning. See Stillaguamish Tribal Summer Chinook HGMP.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

NA

5.3) Broodstock holding and spawning facilities.

NA

5.4) Incubation facilities.

See Stillaguamish Tribal Summer Chinook HGMP.

5.5) Rearing facilities.

At the Whitehorse facility fish are reared in raceways 10' X 50' X 32' (180 fpp) at 250 gpm each. At 110 fpp they are tagged and moved to a 76,200 cubic foot dirt bottom semi-natural rearing pond. Flow is approximately 880 gpm.

5.6) Acclimation/release facilities.

The summer chinook are acclimated and released at the Whitehorse facility from a 76,200 cubic foot dirt bottom semi-natural rearing pond. Flow is approximately 880 gpm.

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

None

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Whitehorse Hatchery is supplied by spring water from Whitehorse Spring. Alarm systems are in place in case of water loss. Flooding has not been an issue since the spring water source is very stable.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Returning natural spawning adult summer chinook to the N.F. Stillaguamish River.

6.2) Supporting information.

6.2.1) History.

As above, only adult summer chinook returning to the N.F. Stillaguamish River have been used for broodstock.

6.2.2) Annual size.

The viability status of this stock has yet to be established. Approximately 30% to 60% of the fish returning to the spawning grounds are marked hatchery chinook originating from the restoration program. The target broodstock collection size is 130-150 fish.(See Stillaguamish Tribal Summer Chinook HGMP).

6.2.3) Past and proposed level of natural fish in broodstock.

See Stillaguamish Tribal Summer Chinook HGMP.

6.2.4) Genetic or ecological differences.

None.

6.2.5) Reasons for choosing.

Indigenous stock.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

NA

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults (See Stillaguamish Tribal Summer Chinook HGMP).

7.2) Collection or sampling design.

See Stillaguamish Tribal Summer Chinook HGMP. WDFW and the tribes shall conduct an evaluation of alternative broodstock collection methods that are available and feasible to supplant the use of small mesh gill nets to procure chinook broodstock for the program.

7.3) Identity.

See Stillaguamish Tribal Summer Chinook HGMP.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

See Stillaguamish Tribal Summer Chinook HGMP.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					

Data source: (Link to appended Excel spreadsheet using this structure. Include hyperlink to main database)

Note: for above information see Stillaguamish Tribal Summer Chinook HGMP.

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

7.6) Fish transportation and holding methods.

Refer to Stillaguamish Tribal Summer Chinook HGMP

7.7) Describe fish health maintenance and sanitation procedures applied.

Refer to Stillaguamish Tribal Summer Chinook HGMP

7.8) Disposition of carcasses.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock

collection program.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Refer to Stillaguamish Tribal Summer Chinook HGMP

8.2) Males.

Refer to Stillaguamish Tribal Summer Chinook HGMP

8.3) Fertilization.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

8.4) Cryopreserved gametes.

NA

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

_____Refer to Stillaguamish Tribal Summer Chinook HGMP.

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. “egg to smolt survival”) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.1.2) Cause for, and disposition of surplus egg takes.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.1.3) Loading densities applied during incubation.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.1.4) Incubation conditions.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.1.5) Ponding.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.1.6) Fish health maintenance and monitoring.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

Refer to Stillaguamish Tribal Summer Chinook HGMP.

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available..

Average survival rate from initial fry ponding through release (1995-99) is 93% (range: 79% to 99%). This is the combined mortality at both the Whitehorse Hatchery (WDFW) and the Harvey Creek Hatchery (Stillaguamish Tribe).

9.2.2) Density and loading criteria (goals and actual levels).

Early rearing densities (at tribal hatchery) are maintained at less than 0.75 lbs/cubic foot and < 7 lbs. of fish/gpm. Final rearing densities are less than 0.10 lbs./cubic foot and less than 4 lbs./gpm. Goal is to maintain rearing and pre-release densities below 0.5 lbs./cubic foot and < 5 lbs./gpm.

9.2.3) Fish rearing conditions

Fish reared at the Harvey Creek Hatchery are on surface water with temperatures ranging between 38 and 50 degrees Fahrenheit. Dissolved oxygen levels are monitored monthly at the hatchery intake in Harvey Creek.. Temperatures at Whitehorse Pond are 46 to 48 degrees Fahrenheit and dissolved oxygen (DO) is between 9 and 10.5 parts per million (ppm).

WDFW shall evaluate rearing conditions at Whitehorse Ponds and make recommendations for capital improvements to benefit the summer chinook program

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

<u>Month (avg.)</u>	<u>Size (fpp)</u>
3/31/00	152
4/30/00	106
5/18/00	78

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

Not available.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Chinook fingerlings at an average size of 400 fish per pound (fpp) are fed BioDiet Grower 4 times a day at approximately 2.5% B.W./day. When the fish reach an average of 100 fpp (at Whitehorse), the BioMoist Feed is provided 3 times per day at approximately 2.0% B.W./day.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Fish are sampled during rearing for the incidence of disease in accordance with the Co-Managers Fish Health Policy. Monthly monitoring exams take place to detect pathogens of concern. Fish vaccines may be used to prevent epizootics associated with two bacterial diseases (vibriosis and enteric redmouth disease). In the event of disease epizootics or elevated mortality, fish pathologists are available to diagnose problems and provide treatment recommendations.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

Not applicable.

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

At the Whitehorse acclimation site, fish have access to significant populations of terrestrial and aquatic insects within the gravel-lined rearing pond.

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

Fish rearing at the Whitehorse facility occurs in a large gravel bottom, spring fed pond, which runs directly into the North Fork Stillaguamish River. This is the same area used by natural-origin fish for rearing and migration. Fish are reared to sub-yearling smolt size which mimics the ocean-rearing life history of the natural population. All fish are coded-wire tagged prior to release.

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

10.1) Proposed fish release levels. *(Use standardized life stage definitions by species presented in Attachment 2. "Location" is watershed planted (e.g. "Elwha River").)*

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling	210,000	70-90	mid-May	Whitehorse Spring Creek
Yearling				

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: Whitehorse Spring Creek (05.0254A)
Release point: Whitehorse Spring Creek (05.0254A) RM 1.5 to confluence with N.F. Stillaguamish which is at RM 28 from confluence to mainstem Stillaguamish River.

Major watershed: Stillaguamish River (05.0001)
Basin or Region: Puget Sound

10.3) Actual numbers and sizes of fish released by age class through the program.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1988								
1989								
1990								
1991					68,000	56		
1992					173,000	62		
1993					100,000	74		

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1994					216,000	60		
1995					211,350	70		
1996					35,000	50		
1997					218,092	90		
1998					47,639	56		
1999					190,654	84		
2000					172,350	78		
2001					192,789	77		
Average					147,716	69		

10.4) Actual dates of release and description of release protocols.

Fish are released by removing outlet screens on the gravel rearing pond in mid-May. Pond screens are left open until most of the fish have volitionally exited the pond. Hatchery staff then lower the pond to force any remaining fish out by Memorial Day. The mid-May hatchery release time coincides with the estimated peak seaward emigration period for naturally spawned fish, based on juvenile outmigrant studies by WDFW and the Stillaguamish and Tulalip Tribes.

10.5) Fish transportation procedures, if applicable.

Not applicable.

10.6) Acclimation procedures (*methods applied and length of time*).

Fish are acclimated at the Whitehorse facility, on the average of 69 days, on Whitehorse Spring Creek water.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

All hatchery fish are adipose-fin clipped/coded-wire tagged. Beginning in 2000, all sub-yearlings produced will be marked with a coded-wire tag only. All fish will be wanded (CWT detector) to differentiate HOR's from NOR's. This application will likely affect the ability to monitor fisheries contribution, but it will protect fish from selective fisheries and enhance the recovery efforts.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

Programmed levels will be controlled by limiting the number of broodstock collected.

10.9) Fish health certification procedures applied pre-release.

The sub-yearlings are fish health certified in accordance with the Co-Managers Fish Health Policy within two weeks of their scheduled release.

10.10) Emergency release procedures in response to flooding or water system failure.

None. On spring water.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

Fish rearing at the Whitehorse facility occurs in a large gravel bottom, spring fed pond, which runs directly into the North Fork Stillaguamish River. This is the same area used by natural-origin fish for rearing and migration. Fish are reared to sub-yearling smolt size which mimics the ocean-rearing life history of the natural population. Their residence time is minimal and interaction with natural fish is decreased.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of “Performance Indicators” presented in Section 1.10.

Note: See section 1.10 for Monitoring and Evaluation. The purpose of a monitoring program is to identify and evaluate the benefits and risks which may derive from the hatchery program. The monitoring program is designed to answer questions of whether the hatchery is providing the benefits intended, while also minimizing or eliminating the risks inherent in the program. A key tool in any monitoring program is having a mechanism to identify each hatchery production group.

Each production group shall be identified with distinct otolith marks, adipose clips, coded wire tags, blank wire tags or other identification methods as they become available, to allow for evaluation of each particular rearing and/or release strategy. This will allow for selective harvest on hatchery stocks when appropriate, monitoring of interactions of hatchery and wild fish wherever they co-mingle in riverine, estuarine and marine habitats and assessment of the status of the target population. WDFW shall monitor the Chinook

salmon escapement into the target and non-target Chinook populations to estimate the number of tagged, un-tagged and marked fish escaping into the river each year and the stray rates of hatchery Chinook into the rivers.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each “Performance Indicator” identified for the program.

See section 1.10.

WDFW shall monitor straying of the summer chinook program fish into the South Fork Stillaguamish River and take appropriate actions to prevent reduced genetic diversity in the South Fork chinook stock.

WDFW shall continue to collect and analyze genetic data from the hatchery program, and natural spawners in the NF and SF Stillaguamish River.

WDFW and the tribes shall evaluate the consistency of time and size of release between the hatchery program fish and naturally produced chinook.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

Funding and resources are currently committed to monitor and evaluate this program as detailed in the Resource Management Plan for Puget Sound Chinook Salmon Hatcheries (Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, August 23, 2002).

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Monitoring and evaluation will be undertaken in a manner which does not result in an unauthorized take of listed chinook.

SECTION 12. RESEARCH

12.1) Objective or purpose.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached “take table” (Table 1).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

Seidel, Paul, 1983, Spawning Guidelines for Washington Department of Fish and Wildlife Hatcheries, Washington Department of Fish and Wildlife, Olympia.

Washington Department of Fish and Wildlife and Washington Treaty Indian Tribes. 1998. Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State. Olympia.

Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, 2002, “Puget Sound Chinook Salmon Hatcheries, Resource Management Plan”, a component of Comprehensive Chinook Salmon Management Plan, August 23, 2002. 103 pages.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

“I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.”

Name, Title, and Signature of Applicant:

Certified by _____ Date: _____

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: <u>Stillaguamish River Summer Chinook</u> ESU/Population: <u>Puget Sound</u> Activity: <u>Whitehorse Hatchery rearing</u>				
Location of hatchery activity: <u>Whitehorse Hatchery</u> Dates of activity: <u>March to May</u> Hatchery program operator: <u>Chuck Lavier</u>				
Type of Take	Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>)			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)				
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)	none	2,200 to 22,000 *	none	
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.

b. Take associated with weir or trapping operations where listed fish are captured and transported for release.

c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.

d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.

e. Listed fish removed from the wild and collected for use as broodstock.

f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.

g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.

h. Other takes not identified above as a category.

Instructions:

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.

2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).

3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table.

* The juveniles are only at Whitehorse for a short time. Additional loss may occur at the Stillaguamish Tribal Hatchery.